EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	34810	crystalliz$6 and (plastic or polymer) and (polyester or polyethylene near terephthalate)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 08:04
L2	34810	crystalliz$6 and (plastic or polymer) and (polyester or polyethylene near terephthalate)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 08:04
L3	17019	crystalliz$6 and (plastic or polymer) and (polyester or polyethylene near terephthalate) and (polycondens$4 or condens$5 or postcondens$5 and post near condens$6)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 08:05
L4	18276	crystalliz$6 and (plastic or polymer) and (polyester or polyethylene near terephthalate) and (polycondens$6 or condens$5 or postcondens$5 and post near condens$6)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 08:05
L5	1768	crystalliz$6 and (plastic or polymer) and (polyester or polyethylene near terephthalate) and (polycondens$6 or condens$5 or postcondens$5 and post near condens$6) and pelletiz$4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 08:05
L6	1727	crystalliz$6 and (plastic or polymer) and (polyester or polyethylene near terephthalate) and (polycondens$6 or condens$5 or postcondens$5 and post near condens$6) and pelletiz$4 and melt$4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 08:06
L7	1696	crystalliz$6 and (plastic or polymer) and (polyester or polyethylene near terephthalate) and (polycondens$6 or condens$5 or postcondens$5 and post near condens$6) and pelletiz$4 and melt$4 and (amorphous or form or shape)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 08:09
L8	828	crystalliz$6 and (plastic or polymer) and (polyester or polyethylene near terephthalate) and (polycondens$6 or condens$5 or postcondens$5 and post near condens$6) and pelletiz$4 and melt$4 and (amorphous)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 08:09

EAST Search History

L9	66	crystalliz$6 and (plastic or polymer) and (polycondens$6 or condens$5 or postcondens$5 and post near condens$6) and pelletiz$4 and melt$4 and (amorphous near (material or plastic))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 08:17
L10	51	crystalliz$6 and (plastic or polymer) and (polycondens$6 or condens$5 or postcondens$5 and post near condens$6) and pelletiz$4 and melt$4 and (amorphous near (material or plastic)) and (polyester or polyethylene near terephthal$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 08:42
L11	4	crystalliz$6 and (plastic or polymer) and (polycondens$6 or condens$5 or postcondens$5 and post near condens$6) and pelletiz$4 and melt$4 and (amorphous near (material or plastic)) and (polyester or polyethylene near terephthal$4) and sieve	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 09:05
L12	4	crystalliz$6 and (plastic and polymer) and (polycondens$6 or condens$5 or postcondens$5 and post near condens$6) and pelletiz$4 and melt$4 and (amorphous near (material or plastic)) and (polyester or polyethylene near terephthal$4) and sieve	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 09:06
L13	4	crystalliz$6 and (plastic and polymer) and (polycondens$6 or condens$5 or postcondens$5 and post near condens$6) and pelletiz$4 and melt$4 and (amorphous near (material or plastic)) and (polyester or polyethylene near terephthal$4) and siev$4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 09:07
L14	4	crystalliz$6 and (plastic) and (polycondens$6 or condens$5 or postcondens$5 and post near condens$6) and pelletiz$4 and melt$4 and (amorphous near (material or plastic)) and (polyester or polyethylene near terephthal$4) and siev$4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 09:10

EAST Search History

L15	4	crystalliz$6 and (plastic) and (polycondens$6 or condens$5 or postcondens$5 and post near condens$6) and pelletiz$4 and melt$4 and (amorphous near (material or plastic)) and (polyester or polyethylene near terephthal$4) and siev$4 and (reheat$4 or heat$4 near2 (again or after or second or repeatedly))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 09:15
L16	4	crystalliz$6 and (plastic) and (polycondens$6 or condens$5 or postcondens$5 and post near condens$6) and pelletiz$4 and melt$4 and (amorphous near (material or plastic)) and (polyester or polyethylene near terephthal$4) and siev$4 and (reheat$4 or heat$4 near2 (again or after or second or repeatedly))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 09:17
L17	4	crystalliz$6 and (plastic) and (polycondens$6 or condens$5 or postcondens$5 and post near condens$6) and pelletiz$4 and melt$4 and (amorphous near (material or plastic)) and (polyester or polyethylene near terephthal$4) and siev$4 and (reheat$4 or heat$4 near2 (again or after or second or repeatedly)) and amorphous	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 09:18
L18	4	crystalliz$6 and (plastic) and (polycondens$6 or condens$5 or postcondens$5 and post near condens$6) and pelletiz$4 and (melting or melted) and (amorphous near (material or plastic)) and (polyester or polyethylene near terephthal$4) and siev$4 and (reheat$4 or heat$4 near2 (again or after or second or repeatedly)) and amorphous	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/09/07 09:19

amorphous

Dictionary
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The American Heritage® dic·tion·ar·ies

a·mor·phous (ə-môr'fəs)
adj.

1. Lacking definite form; shapeless. See synonyms at shapeless.
2. Of no particular type; anomalous.
3. Lacking organization; formless.
4. Lacking distinct crystalline structure.

[From Greek amorphos : a-, without; see a-[1] + morphē, shape.]

amorphously **a·mor'phous·ly** *adv.*
amorphousness **a·mor'phous·ness** *n.*

Science and Technology Encyclopedia
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McGraw Hill Education

Amorphous solid

A rigid material whose structure lacks crystalline periodicity; that is, the pattern of its constituent atoms or molecules does not repeat periodically in three dimensions. In the present terminology amorphous and noncrystalline are synonymous. A solid is distinguished from its other amorphous counterparts (liquids and gases) by its viscosity: a material is considered solid (rigid) if its shear viscosity exceeds $10^{14.6}$ poise ($10^{13.6}$ Pa · s). *See also* Crystal; Viscosity.

Oxide glasses, generally the silicates, are the most familiar amorphous solids. However, as a state of matter, amorphous solids are much more widespread than just the oxide glasses. There are both organic (for example, polyethylene and some hard candies) and inorganic (for example, the silicates) amorphous solids. Glasses can be prepared which span a broad range of physical properties. Dielectrics (for example, SiO_2) have very low electrical conductivity and are optically transparent, hard, and brittle. Semiconductors (for example, As_2SeTe_2) have intermediate electrical conductivities and are optically opaque and brittle. Metallic glasses have high electrical and thermal conductivities, have metallic luster, and are ductile and strong. *See also* Metallic glasses.

The obvious uses for amorphous solids are as window glass, container glass, and the glassy polymers (plastics). Less widely recognized but nevertheless established technological uses include the dielectrics and protective coatings used in integrated circuits, and the active element in photocopying by xerography, which depends for its action upon photoconduction in an amorphous semiconductor. In optical communications a highly transparent dielectric glass in the form of a fiber is used as the transmission medium.

It is the changes in short-range order (on the scale of a localized electron), rather than the loss of long-range order alone, that have a profound effect on the properties of amorphous semiconductors. For example, the difference in resistivity between the crystalline and amorphous states for dielectrics and metals is always less than an order of magnitude and is generally less than a factor of 3. For semiconductors, however, resistivity changes of 10 orders of magnitude between the crystalline and amorphous states are not uncommon, and accompanying changes in optical properties can also be large.

One class of amorphous semiconductors is the glassy chalcogenides, which contain one (or more) of the chalcogens sulfur, selenium, or tellurium as major constituents. These materials have application in switching and memory devices. Another group is the tetrahedrally bonded amorphous solids, such as amorphous silicon and germanium. These materials cannot be formed by quenching from the melt (that is, as glasses) but must be prepared by one of the deposition techniques mentioned above.

When amorphous silicon (or germanium) is prepared by evaporation, not all bonding requirements are satisfied, so a large number of dangling bonds are introduced into the material. These dangling bonds create states deep in the gap which limit the transport properties. The number of dangling bonds can be reduced by a thermal anneal below the crystallization temperature, but the number cannot be reduced sufficiently to permit doping. *See also* Semiconductor.

Technology

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TechEncyclopedia

amorphous

Unorganized or vague. A lack of structure. For example, the amorphous state of a spot on a rewritable optical disk means that the laser beam will not be reflected from it, which is in contrast to a crystalline state which will reflect light. See crystalline.

- Find the latest news, features and reviews relating to "amorphous" from CMP's TechSearch.

Thesaurus

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HOUGHTON MIFFLIN COMPANY

amorphous

adjective

Having no distinct shape: formless, inchoate, shapeless, unformed, unshaped. *See* order/disorder.

Antonyms

Directory > Reference > Antonyms > amorphous

Answers.com

amorphous
adj

Definition: without definite shape, character
Antonyms: definite, distinct, distinctive, shaped, shapely

Medical

Directory > Health > Medical Dictionary > amorphous

HOUGHTON MIFFLIN COMPANY

a·mor·phous (□-môr'f□s)
adj.

1. Lacking definite form; shapeless.
2. Lacking organization; formless.
3. Lacking distinct crystalline structure.

Word Tutor

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eSpindle

amorphous

IN BRIEF: Without a definite shape.

Gelatin is amorphous until it is placed in a mold.

WordNet

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Note: click on a word meaning below to see its connections and related words.

The *adjective* amorphous has 3 meanings:

Meaning #1: having no definite form or distinct shape
Synonyms: formless, shapeless

Meaning #2: lacking the system or structure characteristic of living bodies
Synonym: unstructured

Meaning #3: without real or apparent crystalline form
Synonyms: uncrystallized, uncrystallised

Wikipedia

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amorphous solid

Wax and paraffin are amorphous.

An **amorphous solid** is a solid in which there is no long-range order of the positions of the atoms. (Solids in which there is long-range atomic order are called crystalline solids.) Most classes of solid materials can be found or prepared in an amorphous form. For instance, common window glass is an amorphous ceramic, many polymers (such as polystyrene) are amorphous, and even foods such as cotton candy are amorphous solids.

Amorphous materials are often prepared by rapidly cooling molten material. The cooling reduces the mobility of the material's molecules before they can pack into a more thermodynamically favorable crystalline state. Amorphous materials can also be produced by additives which interfere with the ability of the primary constituent to crystallize. For example addition of soda to silicon dioxide results in window glass and the addition of glycols to water results in a vitrified solid.

Some materials, such as metals, are difficult to prepare in an amorphous state. Unless a material has a high melting temperature (as ceramics do) or a low crystallization energy (as polymers tend to), cooling must be done extremely rapidly.

Amorphous solids can exist in two distinct states, the 'rubbery' state and the 'glassy' state. The temperature at which the transition between the glassy and rubbery states is called their glass transition temperature or T_g.

Glasses

In common parlance, the term glass refers to amorphous oxides, and especially silicates (compounds based on silicon and oxygen). Ordinary soda-lime glass, used in windows and drinking containers, is created by the addition of soda and lime (calcium oxide) to silicon dioxide. Without these additives silicon dioxide will (with slow cooling) form sand or quartz crystal, not glass.

To avoid confusion, other types of glass often are referred to with a modifier, such as the term *metallic glass* to refer to amorphous metallic alloys.

Metallic glass

Unsolved problems in physics: *What is the nature of the transition between a fluid or regular solid and a glassy phase? What are the physical processes giving rise to the general properties of glasses?*

Some amorphous metallic alloys can be prepared under special processing conditions (such as rapid solidification, thin-film deposition, or ion implantation), but the term "metallic glass" refers only to rapidly solidified materials.

Even with special equipment, such rapid cooling is required that, for most metals, only a thin wire or ribbon can be made amorphous. This is enough for many magnetic applications, but thicker sections are required for most structural applications such as scalpel blades, golf clubs, and cases for consumer electronics. Recent efforts have made it possible to increase the maximum thickness of glassy castings, by finding alloys where kinetic barriers to crystallization are greater. Such alloy systems tend to have the following inter-related properties:

- Many different solid phases are present in the equilibrium solid, so that any potential crystal will find that most of the nearby atoms are of the wrong type to join in crystallization
- The composition is near a deep eutectic, so that low melting temperatures can be achieved without sacrificing the slow diffusion and high liquid viscosity seen in alloys with high-melting pure components
- Atoms with a wide variety of sizes are present, so that "wrong-sized" atoms interfere with the crystallization process by binding to atom clusters as they form.

One such alloy is the commercial "Liquidmetal", which can be cast in amorphous sections up to an inch thick.

Other synthesis routes

Amorphous solids produced by other routes, such as ion implantation and thin-film deposition are, technically speaking, not glasses.

Damage

One way to produce a material without an ordered structure is to take a crystalline material and remove the order by damaging it. A practical, controllable way to do this is by firing ions into the material at high speed, so that collisions inside the material knock all atoms from their original positions. This technique is known as ion implantation, and only forms amorphous solids if the material is too cold for atoms to diffuse back to their original positions as the process continues.

Cold deposition

Techniques such as sputtering and chemical vapour deposition can be used to deposit a thin film of material onto a surface. If the surface is kept cold, the atoms being deposited will not, on average, gain enough energy to diffuse along the surface until they find a place in an ordered crystal. For every deposition technique, there is a substrate temperature below which the deposited film will be amorphous. However, surface diffusion requires much less energy than diffusion through the bulk, so that these temperatures are often lower than those required to make amorphous films by ion implantation.

Toward a strict definition

It is difficult to make a distinction between truly amorphous solids and crystalline solids in which the size of

the crystals is very small (less than two nanometres). Even amorphous materials have some short-range order among the atomic positions (over length scales of about one nanometre). Furthermore, in very small crystals a large fraction of the atoms are located at or near the surface of the crystal; relaxation of the surface and interfacial effects distort the atomic positions, decreasing the structural order. Even the most advanced structural characterization techniques, such as x-ray diffraction and transmission electron microscopy, have difficulty in distinguishing between amorphous and crystalline structures on these length scales.

The transition from the liquid state to the glass, at a temperature below the equilibrium melting point of the material, is called the glass transition. From a practical point of view, the glass transition temperature is defined empirically as the temperature at which the viscosity of the liquid exceeds a certain value (commonly 10^{13} pascal-seconds). The transition temperature depends on cooling rate, with the glass transition occurring at higher temperatures for faster cooling rates. The precise nature of the glass transition is the subject of ongoing research. While it is clear that the glass transition is not a first-order thermodynamic transition (such as melting), there is debate as to whether it is a higher-order transition, or merely a kinetic effect.

Glass is often referred to as a 'super-cooled' liquid: this amounts to an assertion that the glass transition is purely a kinetic, rather than a thermodynamic effect. One argument against speaking this way is the fact that many supercooled liquids flow (see pitch drop experiment) whereas glass does not (see special section in glass).

Some examples of amorphous solids are glass, polystyrene, and the silicon in many thin film solar cells.

See also

- Glass
- Supercooling
- Vitrification

External links

- Vogel-Tammann-Fulcher Equation Parameters
- Fragility thy name is glass

Phases of matter

Solid | **Amorphous solid** | Liquid | Gas | Plasma | Superfluid | Supersolid | Degenerate matter | Quark-gluon plasma | Fermionic condensate | Bose-Einstein condensate | Strange matter

Translations

Directory > Words > Translations > amorphous

Translations for: Amorphous

Dansk (Danish)
adj. - amorf, uden bestemt form

Nederlands (Dutch)
amorf

Français (French)
adj. - amorphe, informe, sans forme

Deutsch (German)
adj. - amorph, formlos

Ελληνική (Greek)
adj. - άμορφος, στερούμενος μορφής, ασχημάτιστος, (χημ.) ακρυστάλλωτος, στερούμενος κρυσταλλικής δομής

Italiano (Italian)
amorfo

Português (Portuguese)
adj. - amorfo

Русский (Russian)
аморфный, хаотичный

Español (Spanish)
adj. - amorfo

Svenska (Swedish)
adj. - amorf

中文（简体）(Chinese (Simplified))
无定形的, 无组织的, 非结晶形的, 乱七八糟的

中文（繁體）(Chinese (Traditional))
adj. - 無定形的, 無組織的, 非結晶形的, 亂七八糟的

한국어 (Korean)
adj. - 무정형의, 애매한

日本語 (Japanese)
adj. - 無定形の, 組織のない, 非結晶の

العربيه (Arabic)
(صفه) غير متبلور, لا متبلور, لا شكل له, غير منظم

עברית (Hebrew)
adj. - נטול צורה, אמורפי

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Mentioned In

amorphous is mentioned in these AnswerPages:

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Beilby layer (metallurgy)
glass transition temperature (physical chemistry)
organic glass (materials)
Spodosol (geology)
spodic horizon (geology)
amorphous memory array (computer science)
magister of sulfur (chemistry)
schungite (geology)
amorphism
More>

amorphous film

Science and Technology Dictionary

amorphous film (□'mör·f□s 'film)

(*materials*) A magnetically ordered metallic film that can be deposited on a semiconductor chip or on almost any other material without need for a crystal substrate, for use in magnetic bubble memories.

▼*Continued below...*

Mentioned In

amorphous film is mentioned in these AnswerPages:

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Roll-to-roll processing
Glass switch
amorphous silicon
amorphous solid
field effect transistor
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